

General Science & Ability

What is Galaxy?

↳ A galaxy is a gravitational bound system containing ~~of~~ things in it.

These are:

1. Black hole
2. Stars
3. Stellar Remnants
4. nebulae (interstellar gas and dust)
5. planets and dwarf planets
6. small solar system bodies (asteroids & comets)
7. satellites

↳ Sun is a star - total age is 10 billion years

lived 4.5 billion years

remaining 5.5 billion years

How Sun/a star is formed/produced?

↳ Some matter, non matter, gases, dust starts accumulating.

↳ After gathering, they become a nebulae

↳ Nebulae starts burning due to presence of excess H_2 (Hydrogen), Stars is produced.

↳ Star is a burning object.

↳ It lives its life of billions of years and then an explosion occurs called super nova / star death.

↳ But even after death, it doesn't disappear

suddenly, it remains for 600-700 years as stellar remnants (radiations) and then disappears forever.

Important Points:-

- * Sun revolves around black hole / galactic centre / Sagittarius A*
- * Planets and dwarf planets revolve around the Sun.
- * Natural satellite i.e.: Moon revolves around the planets and dwarf planets
- * Small solar bodies revolve around the satellite.

What are the types of Galaxies?

- ↳ There are billions of galaxies in our universe.
- ↳ According to Hubble Tuning Fork diagram, there are following types of galaxies:
 - * Spiral Galaxies
 - * Elliptical Galaxies
 - * Lenticular Galaxies
 - * Irregular Galaxies (more recent)

↳ Spiral Galaxies

- * Flat
 - * Rotating
 - * Spiral in structure
- i.e:

Milky way - Andromeda

↳ Elliptical Galaxies

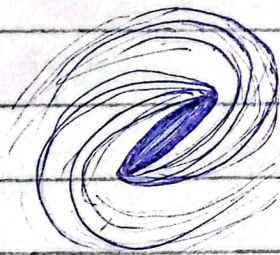
- * Elliptical means egg-like
- * elliptical profile, giving an ellipsoidal appearance regardless of the angle.

i-e:

ex. galaxy M49 & M59

↳ Lenticular Galaxies

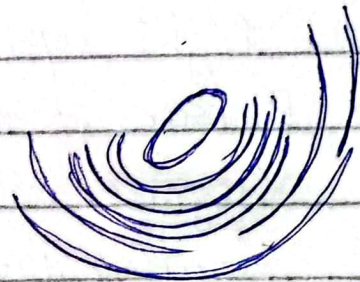
- * Which has the properties of both elliptical and spiral. - an intermediate form



Spiral



Elliptical



Lenticular

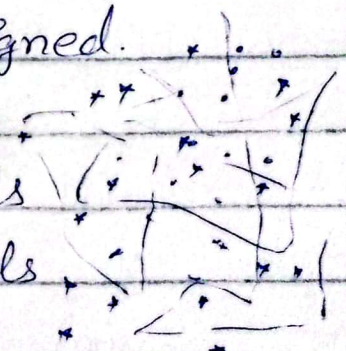
↳ Irregular Galaxies

- * every galaxy which doesn't fit in the Hubble Tunning classification scheme
- * Structure is not neatly aligned.

i-e:

The Small Magellanic clouds

The large Magellanic clouds



Irregular

Salient Features of Milkyway

- ↳ Spiral Galaxy.
- ↳ Diameter 100,000 - 180,000 light years.
- ↳ Giant Galaxy - 100-400 billion / 1-4 trillion
- ↳ Home to $\frac{1}{1000}$ stars are present in our solar system.
- ↳ Solar System location on galaxy is on its Orion-Cygnus arm.
- ↳ Distance from solar system to Black hole / galactic disc / Aegitarius A* centre is about 26,200 - 27000 light years.
- ↳ Perseus, Sagittarius, Centaurus and Cygnus are the arms of milkyway galaxy.

What will be the future of Milkyway?

- ↳ Andromeda is approaching towards milkyway in about 4 billions years it will reach it at velocity of 100 km/s. *(like Heo)*
- ↳ Like Heo merging of galaxies in Feb - 2024, Andromeda and milkyway will get merged.
- ↳ When two galaxies collide/merge stars do not collide/destroy because

- of a large distance between them (they are far from each other that they will only get dense).

Important Points

- * Concentration of stars is more towards the black hole than the concentration of stars away from the black hole.
- * Some stars may get disappear which are present at the inner boundary of the black hole at the event horizon they never get felt back again.
- * Black hole evidence is the negligible amount of smoke called Hawking radiation.